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(54) **VIEW SHARING BETWEEN IN-RANGE DEVICES**

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(60) Provisional application No. 60/505,276, filed on Sep. 23, 2003.

(51) **Int. Cl.**

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H04W 76/02	(2009.01)
H04L 29/06	(2006.01)
H04N 1/00	(2006.01)
H04N 1/42	(2006.01)
H04W 12/08	(2009.01)
H04L 29/08	(2006.01)
H04W 12/06	(2009.01)

(52) **U.S. Cl.**

CPC ***H04W 76/02*** (2013.01); ***H04L 63/0492*** (2013.01); ***H04L 63/10*** (2013.01); ***H04L 67/04*** (2013.01); ***H04L 67/36*** (2013.01); ***H04N 1/00315*** (2013.01); ***H04N 1/42*** (2013.01); ***H04W 4/00*** (2013.01); ***H04W 12/08*** (2013.01); *H04L 63/08* (2013.01); *H04W 12/06* (2013.01)

(58) **Field of Classification Search**

USPC 455/418, 419, 420; 370/328, 338; 709/208

See application file for complete search history.

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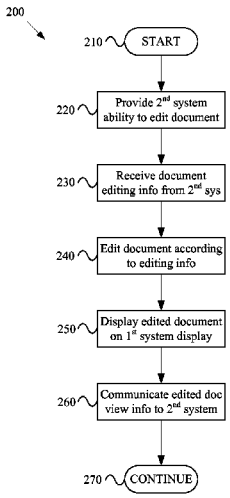
(57) **ABSTRACT**

A first system may receive a view from a second system. The first system may establish a direct wireless communication link with the second system that does not connect through any intermediate system between the first system and the second system. Through the direct wireless communication link, the first system sends a view sharing request to the second system. The view sharing request may specify a view that is displayed by the second system and not the first system. The first system may receive view information corresponding to the view and display the view according to the received view information.

24 Claims, 6 Drawing Sheets



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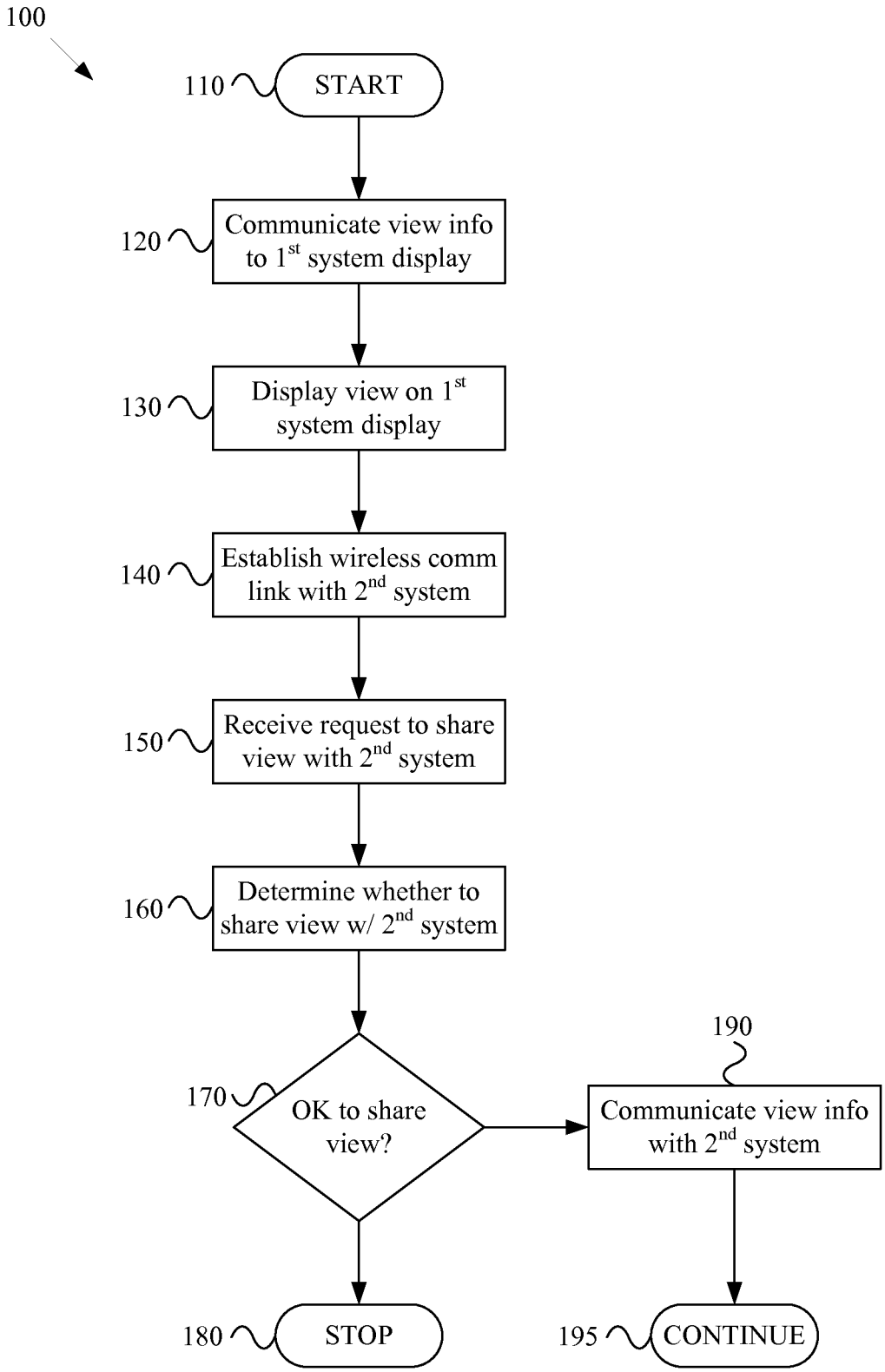
100
110
START
120
Communicate view info to 1st system display
130
Display view on 1st system display
140
Establish wireless comm link with 2nd system
150
Receive request to share view with 2nd system
160
Determine whether to share view w/ 2nd system
170
OK to share view?
190
Communicate view info with 2nd system
180
STOP
195
CONTINUE

Figure 1

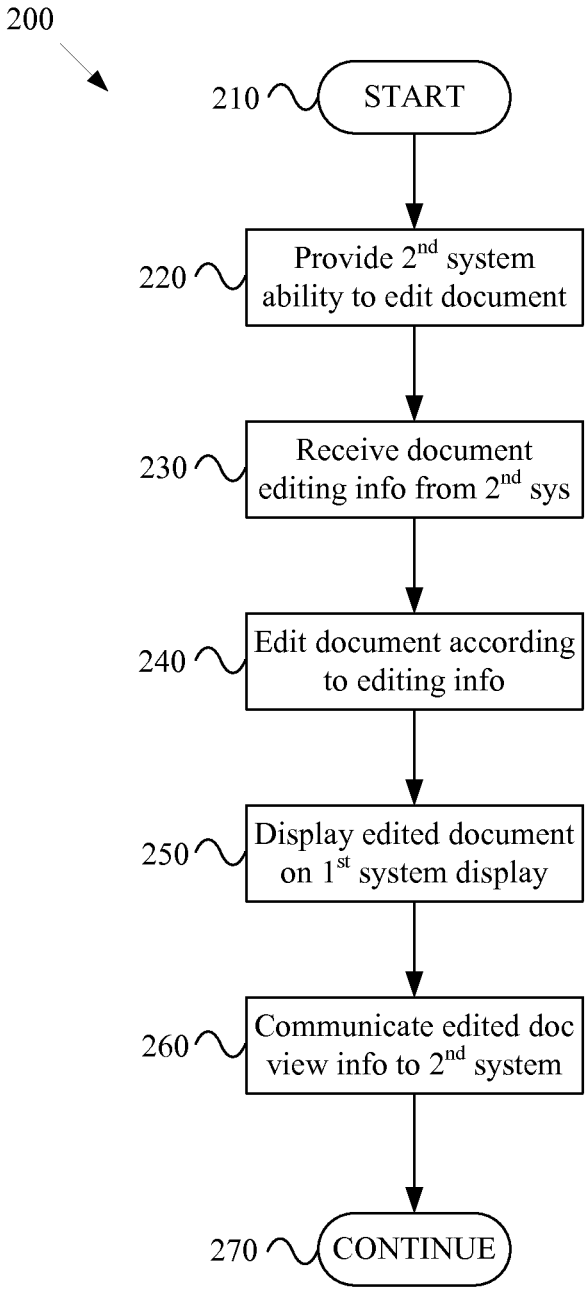
200
210
START
220
Provide 2nd system ability to edit document
230
Receive document editing info from 2nd sys
240
Edit document according to editing info
250
Display edited document on 1st system display
260
Communicate edited doc view info to 2nd system
270
CONTINUE

Figure 2

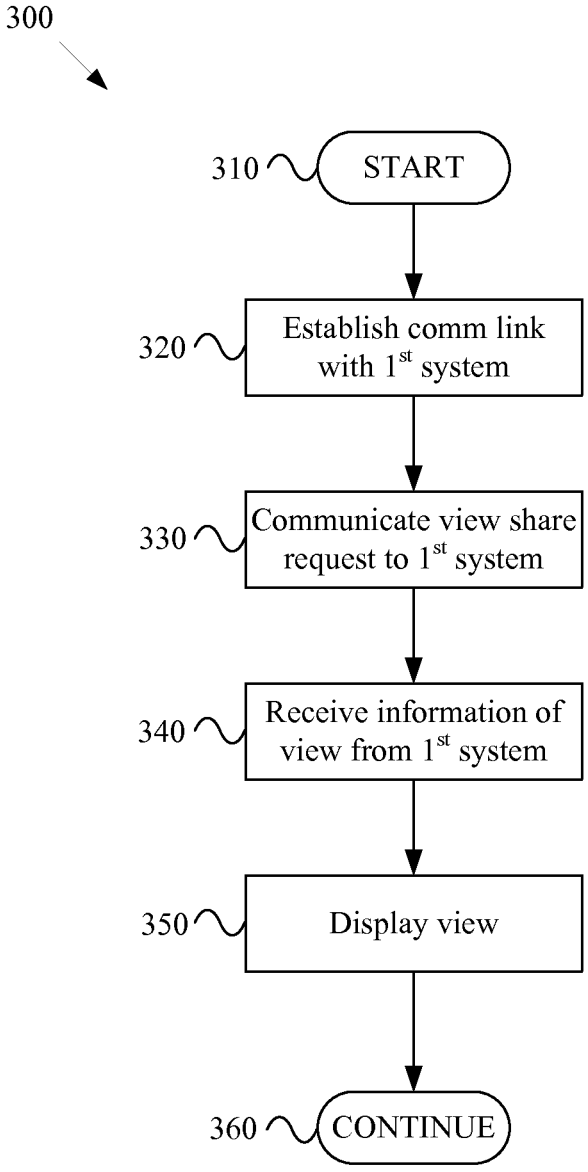
300
310
START
320
Establish comm link with 1st system
330
Communicate view share request to 1st system
340
Receive information of view from 1st system
350
Display view
360
CONTINUE

Figure 3

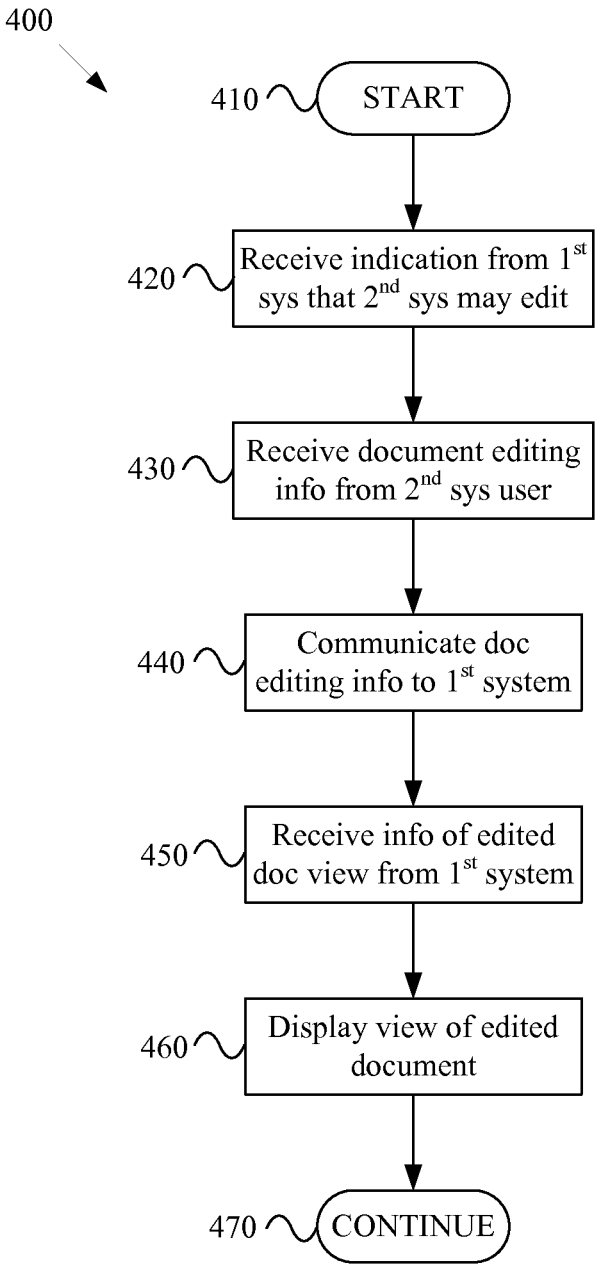
400
410
START
420
Receive indication from 1st sys that 2nd sys may edit
430
Receive document editing info from 2nd sys user
440
Communicate doc editing info to 1st system
450
Receive info of edited doc view from 1st system
460
Display view of edited document
470
CONTINUE

Figure 4

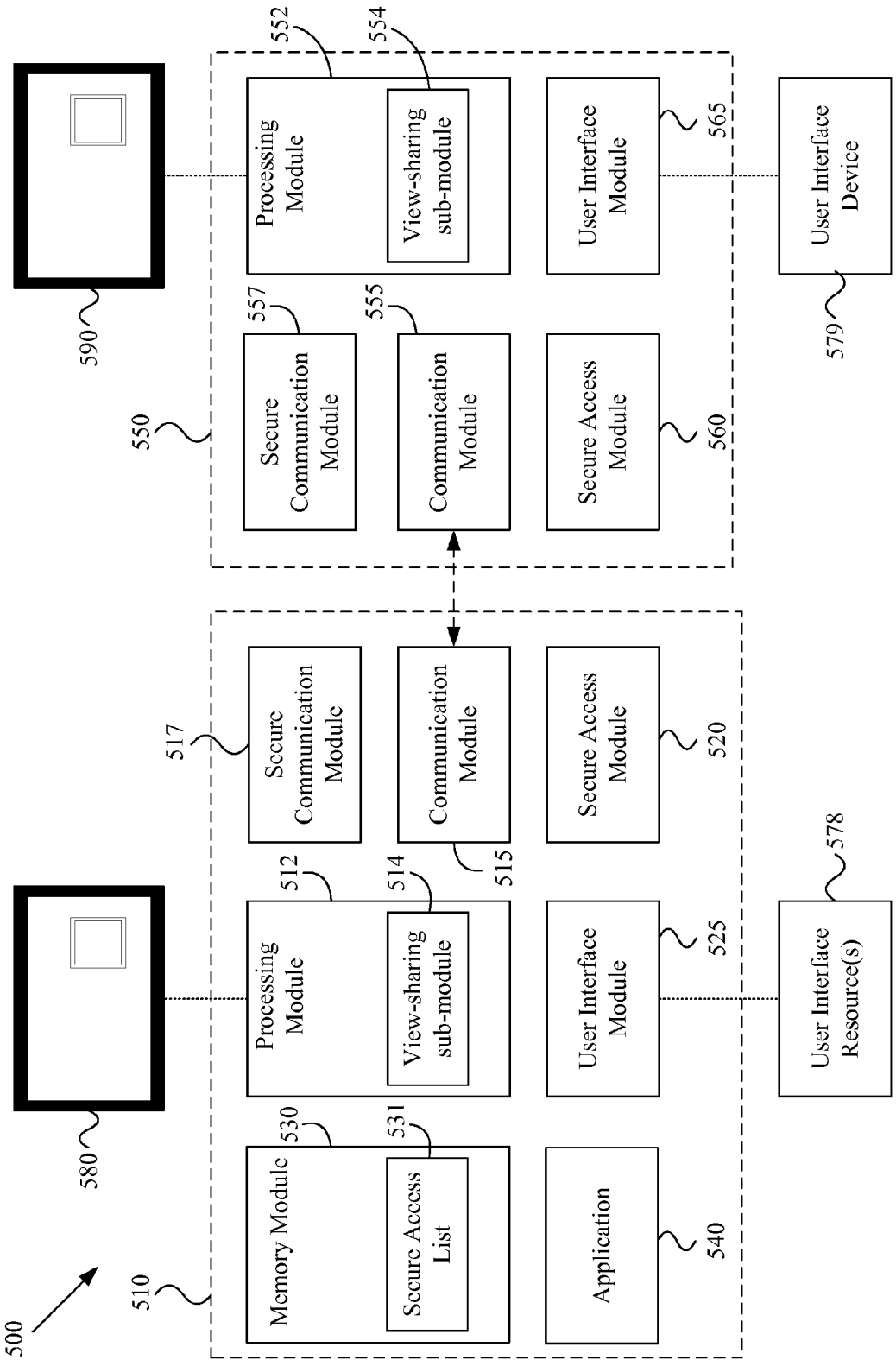
500
510
580
590
550
552
554
Processing Module
View-sharing sub-module
557
Secure Communication Module
555
Communication Module
560
Secure Access Module
565
User Interface Module
579
User Interface Device
517
Secure Communication Module
515
Communication Module
520
Secure Access Module
512
514
Processing Module
View-sharing sub-module
525
User Interface Module
578
User Interface Resource(s)
530
531
Memory Module
Secure Access List
540
Application

Figure 5

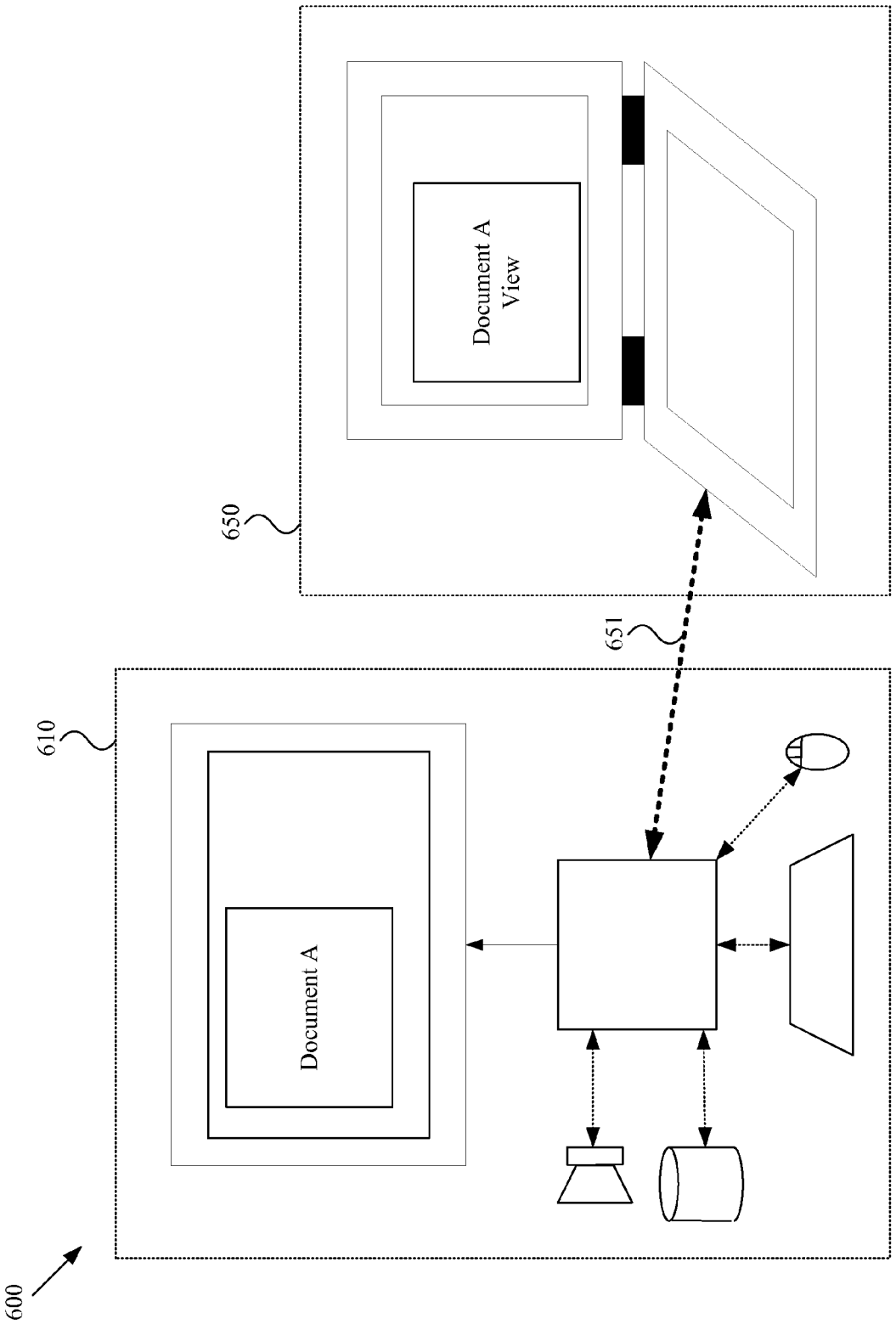

Figure 6

VIEW SHARING BETWEEN IN-RANGE DEVICES

1. CROSS REFERENCE TO RELATED APPLICATIONS

This application is continuation of and claims the benefit of priority to U.S. application Ser. No. 13/041,708 filed Mar. 7, 2011, which is a continuation of and claims the benefit of priority to U.S. application Ser. No. 10/885,405 filed Jul. 6, 2004, now U.S. Pat. No. 7,920,528, which is a non-provisional of and claims the benefit of priority to U.S. Application Ser. No. 60/505,276 filed Sep. 23, 2003, the contents of each of which are hereby incorporated herein by reference in their entirety.

2. BACKGROUND

In a dynamic wireless network environment, resources and their associated users may generally freely enter and leave a wireless network. For example, a user of a portable computer resource may enter a conference room having a personal area network. Also for example, a user of an office computing station may explicitly command the office computing station to join a dynamic wireless network. Additionally, for example, a portable network resource having power save capability may exit a dormant power save state and begin participating in a wireless communication network.

Various users in such a dynamic wireless communication network may desire to communicate a variety of information with other users in the dynamic network. In various scenarios, for example, a team of users may contribute to the creation of a common document or presentation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a flow diagram illustrating a method for a first system in a wireless communication network to share a view with a second system, in accordance with various aspects of the present invention.

FIG. **2** is a flow diagram illustrating a method for a first system in a wireless communication network to provide a second system with the capability to edit a document in a shared view, in accordance with various aspects of the present invention.

FIG. **3** is a flow diagram illustrating a method for a second system in a wireless communication network to share a first system's view, in accordance with various aspects of the present invention.

FIG. **4** is a flow diagram illustrating a method for a second system in a wireless communication network to share a first system's document view and document editing capability, in accordance with various aspects of the present invention.

FIG. **5** is a diagram showing an exemplary system that provides view sharing, in accordance with various aspects of the present invention.

FIG. **6** is a diagram illustrating a view sharing and document-editing scenario in accordance with various aspects of the present invention.

DETAILED DESCRIPTION

FIG. **1** is a flow diagram illustrating a method **100** for a first system in a wireless communication network to share a view with a second system, in accordance with various aspects of the present invention. The method **100** begins at step **110**. Various events and conditions may cause the method **100** to begin. For example, a user of the first system or the second system may request that the first system share a view with the second system. Alternatively, for example, the first and/or second system may be configured to automatically share a view under particular triggering circumstances. Generally, the method **100** may be initiated for a variety of reasons. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular initiating events or conditions.

The method **100**, at step **120**, may comprise communicating information of a view to a display resource of the first system. The following discussion will often refer to views and view sharing. Additionally, the following discussion will also refer to various exemplary scenarios that may comprise sharing a view of a document (e.g., a word processing document, presentation document, or graphics document). Information of such an exemplary document view may, for example, be generated by a document processing application executing on the first system. It should be noted that the scope of various aspects of the present invention should not be limited by characteristics of a particular view or by how such a view may be presented to a user by various systems.

The method **100**, at step **130**, may comprise displaying the view on the display resource of the first system. Characteristics of the view may change at various points in the viewing process. The view may be dynamic or static. That is, the view may comprise an image that is not changing and/or an image that is changing. In general, the view may comprise any of a large variety of view characteristics.

For example, in an exemplary scenario, the display resource may present a view to a user in a window format. A user may then, for example, vary characteristics of the view and/or window. For example and without limitation, the user may alter the dimensions of the window or reduce the view to an icon when not immediately using the view. Alternatively, for example, a view may occupy an entire display screen or multiple screens of the display resource.

The method **100**, at step **140**, may comprise establishing a two-way wireless communication link between the first system and the second system. Such a wireless communication link may, for example, comprise a direct wireless communication link between the first system and the second system. The following discussion will generally discuss a two-system scenario for the sake of clarity. However, various aspects of the present invention readily extend to dynamic wireless communication networks comprising more than two systems. For example and without limitation, the first system may share a view with two other systems, three other systems, or other number of systems in one or more dynamic wireless communication networks. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of view sharing between only two systems.

Step **140** may comprise establishing the two-way wireless communication link between the first system and the second system using a variety of media and protocols. For example, the two-way wireless communication link may comprise an RF communication link and/or an optical communication link. Also for example, the two-way wireless communication link may be based on any of a large number of standard or propriety communication protocols. Various standard communication protocols may, for example, comprise IEEE 802.11, 802.15, Bluetooth, or ultra-wideband (UWB) communication protocols. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular wireless communication medium and/or communication protocol.

The method **100**, at step **150** may, for example, comprise the first system receiving a request for the first system to share a view with the second system. Such a request may, for example, originate from the first system or the second system (e.g., from a user of the first system or a user of the second system). In an exemplary scenario, a user of the second system may initiate a request from the second system to the first system for the first system to share a particular view or any view with the second system. In another exemplary scenario, the first system may communicate with the second system to ask the second system, or user thereof, whether the second system desires to share a particular view of the first system. In an additional exemplary scenario, a user of the first system may request the first system to share the view with the second system. In general, step **150** may comprise the first system receiving a request to share a view with the second system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular request (or source thereof) for sharing a view.

Still further, for example, the method **100** may comprise the first system communicating view information to the second system without an explicit request from the second system for the first system to share the view. In an exemplary scenario, a user of the first system may select the second system from a list of systems in the wireless communication network. The first system may respond to the user request by communicating information of the view to the second system without receiving a request from the second system. Accordingly, the scope of various aspects of the present invention should not be limited by whether or not the second system or user thereof requests the first system to share a view with the second system.

The method **100**, at step **160**, may comprise the first system determining whether to share the view with the second system. Step **160** may, for example, comprise determining whether the second system (e.g., including the user thereof) should have access to the view. For example and without limitation, step **160** may comprise the first system communicating with a user of the first system to determine whether the second system should have access to the view. Alternatively, for example, step **160** may comprise the first system analyzing a list of authorized systems and/or users to determine whether the second system should have access to the view. Such a list may, for example, be stored in memory accessible to the first system. Also for example, in a scenario involving sharing a view that comprises sensitive information, step **160** may comprise the first system analyzing secure communication capability of the second system to determine whether the second system has the necessary secure communication capability to protect the sensitive information in the view.

Further, for example, the first system may communicate a variety of authorization and authentication information with the second system. In general, step **160** may comprise performing any of a variety of authorization and/or authentication operations. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular ways of determining whether to share the view with the second system.

The method **100**, at step **170**, may comprise utilizing the determination made at step **160** to determine execution flow of the method **100**. For example, if step **160** determines that the second system is not authorized to share the view, then step **170** may direct method **100** flow to step **180**, which may terminate view share processing between the first system and the second system. Alternatively, if step **160** determines that the second system is authorized to share the view, then step **170** may direct method **100** flow to step **190**.

The method **100**, at step **190**, may comprise the first system communicating information of the view to the second system. The first system may communicate information of the view to the second system in any of a variety of ways. For example and without limitation, the first system may communicate JPEG and/or MPEG encoded information to the second system. Also for example, the first system may communicate graphical and textual information to the second system. The first system may, for example, communicate information of the view to the second system over the wireless communication link established at step **140**. Alternatively, for example, the first system may establish additional communication links or channels over which to communicate information of the view to the second system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular view information types or characteristics of particular communication links or channels utilized to communicate the view information from the first system to the second system.

Step **190** may, for example, comprise establishing a secure wireless communication link (e.g., one-way or two-way) between the first system and the second system. For example, in a scenario where the shared view comprises sensitive information, step **190** may comprise establishing a secure communication link comprising encryption and decryption of at least the sensitive information in the shared view. Step **190** may, for example, comprise adding secure communication aspects to the wireless communication link established at step **140**.

The method, at step **195**, may comprise performing additional process steps that may, for example, comprise utilizing the shared view. For example, the first and/or second system may communicate to modify and/or edit the shared view. For example, the first system may provide the second system (e.g., a user thereof) the capability to modify aspects of the original shared view at the first system. The first system may then, for example, receive view modification information from the second system.

In one exemplary scenario, the first system may provide the second system the ability to control movement of the original view at the first system. The first system may then, for example, receive view modification information from the second system. In another exemplary scenario, the first system may provide the second system the ability to edit a document in the original view at the first system. The first system may then, for example, receive document-editing information from the second system.

The following discussion will present the method **200** illustrated in FIG. **2** as an example of such continued processing. Note, however, that the method **200** is merely an example, and should by no means limit the scope of various aspects of the present invention.

FIG. **2** is a flow diagram illustrating a method **200** for a first system in a wireless communication network to provide a second system with the capability to edit a document in a shared view, in accordance with various aspects of the present invention.

The method **200** begins at step **210**. Various events and conditions may cause the method **200** to begin. For example, the first system may be operating in accordance with step **195** of the method **100** illustrated in FIG. **1** and discussed previously. Alternatively, for example, a user of the first system may direct the first system to provide document-editing capability to the second system. Also for example, the second system may have the ability to acquire the document editing capability without a directive from the first system. Further for example, a third moderating system may provide the second system with the capability to edit a document in a

shared view. Generally, the method **200** may be initiated for a variety of reasons. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular initiating events, conditions or systems.

The exemplary method **200**, at step **220**, comprises the first system providing to the second system the capability to edit a document in a shared view. The first system may, for example, communicate to the second system that the second system (e.g., a user thereof) may edit the document in the shared view. As an example, the first system may pass a token to the second system indicating that the second system has editing privileges for the document.

Step **220** may also comprise initializing various operational and communicational characteristics of the first system to be able to receive and process document editing information received from the second system. Such initialization may comprise, for example, initializing a communication link over which such document editing information may be communicated (e.g., a secure communication link for editing a sensitive document). In general, step **220** may comprise the first system providing to the second system the capability to edit a document in a shared view. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular way of providing document-editing capability to the second system.

The method **200**, at step **230**, may comprise receiving document editing information from the second system. For example, a user of the second system may use a user interface device of the second system to type, modify graphics, cut and paste elements, and generally perform any editing capability as though the document and associated processing application were residing on the second system. This may be the case, for example, even though the second system may not include the data associated with the original document or the particular document processing application that is generating the original view of the document at the first system. Step **230** may, for example, comprise receiving document editing information from the second system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular types of editing information or particular ways of communicating such information.

The method **200**, at step **240**, may comprise editing the original document of the view according to document editing information received from the second system at step **230**. For example, the first system may receive any of a large variety of editing commands from the second system (e.g., cut, paste, delete, insert text, cursor movement, drawing selection, etc.). Step **240** may, for example, comprise the first system processing the editing commands from the second system as though the commands were originating at the first system. For example, the document processing application generating the document on the first system may not be aware of the source of the editing commands.

In an exemplary illustration, view-sharing functionality of the first system may create an editing command path between the wireless communication link with the second system and a document processing application executing on the first system. The view-sharing functionality may then replace the typical editing command path from the user interface of the first system with the command path from the wireless communication link. In general, step **240** may comprise editing the original document of the view according to document editing information received from the second system at step **230**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular ways of processing such editing commands.

The method **200**, at step **250**, may comprise displaying the edited document from step **240** on a display device of the first system. For example, after editing the document of the view according to the editing instructions from the second system at step **240**, the first system may communicate information of the edited document and/or view thereof to a display device of the first system for display to a user. In such an exemplary scenario, a user of the first system can view changes made to a document by a user of the second system.

The method **200**, at step **260**, may comprise communicating information of the view comprising the edited document to the second system. For example, after editing the document of the view according to the editing instructions from the second system at step **240**, the first system may communicate information of the edited document and/or view thereof to the second system. Such communication may, for example, occur in a manner similar to that discussed with regard to step **190** of the method **100** illustrated in FIG. **1** and discussed previously. In such an exemplary scenario, a user of the second system that is generating the document editing commands may view the document modifications resulting from the user's editing commands in real-time as the user is generating the editing commands.

The method **200**, at step **260**, may then continue processing the shared view, for example, in accordance with further commands from a user of the second system and/or user of the first system.

FIG. **3** is a flow diagram illustrating a method for a second system in a wireless communication network to share a first system's view, in accordance with various aspects of the present invention. The method **300** begins at step **310**. Various events and conditions may cause the method **300** to begin. For example, a user of the first system or the second system may request that the first system share a view with the second system. Alternatively, for example, the first and second systems may be configured to automatically share a view under particular triggering circumstances. Generally, the method **300** may be initiated for a variety of reasons. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular initiating events or conditions.

The method **300**, at step **320**, may comprise establishing a two-way wireless communication link with the first system. Such a two-way wireless communication link may, for example, comprise a direct communication link between the second and first systems. Step **320** may, for example and without limitation, share various aspects with step **140** of the method **100** illustrated in FIG. **1** and discussed previously. Step **320** (or a subsequent step) may comprise integrating secure communication functionality into the two-way wireless communication link. For example, in an exemplary scenario where information of the shared view (or other communicated information) is sensitive, the second system may communicate with the first system to establish a secure communication link between the second system and the first system. Such a secure communication link may, for example, comprise performing any of a large variety of secure communication techniques (e.g., encryption and frequency hopping). Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular secure communication techniques.

Step **320** (or a subsequent step) may comprise communicating secure access information with the first system. For example, in an exemplary scenario where the shared view comprises sensitive information, or where other communicated information between the second system and the first system may be sensitive, the first system may require that the

second system (or user thereof) be authorized to access the view. For example and without limitation, the first system may have access to a list of authorized systems and/or users that may access the view.

The first system may, for example, require the second system to communicate any of a variety of secure access information (e.g., authorization or authentication information) to the first system. Such information may, for example, comprise system identification information and user identification information (e.g., user ID and password, retinal scan, thumb print, facial pattern information, voice pattern information, etc.). The second system may communicate any necessary secure access information to the first system for the first system to utilize in determining whether the second system should be allowed access to the view. Step **320** may, for example, generally comprise communicating secure access information with the first system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular secure access information, communication or processing techniques.

The method **300**, at step **330**, may comprise communicating a request to the first system for the first system to share a view with the second system (e.g., a view that the first system is currently displaying). Such a request, for example, may comprise an open request for a view or may comprise a request for a specific view. Such a request may, for example, originate from a user of the second system. Such a request may, for example, be in response to an offer to provide a view that is communicated to the second system by the first system. The second system may, for example, communicate such a request to the first system over the wireless communication link established at step **320**. In general, step **330** may comprise the second system communicating a request to the first system to share a view with the second system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular request, request type, request source, or way of communicating such a request.

As mentioned previously, a view may comprise any of a large variety of view characteristics. A view may, for example, comprise dynamic or static image information. A view may, for example, comprise a view of a document (e.g., a document generated by a document processing application executing on the first system). A view may, for example, comprise textual, graphical or pictorial aspects. A view may, for example, comprise image information in a window format or may comprise image information for an entire display screen (or multiple screens). Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view or view type.

The method **300**, at step **340**, may comprise receiving information of the view from the first system. Such information may, for example, have been communicated to the second system by the first system in accordance with method step **190** of the method **100** illustrated in FIG. **1** and discussed previously. The second system may receive information of the view in a variety of ways. For example and without limitation, the second system may receive JPEG and/or MPEG encoded information from the first system. Also for example, the second system may receive graphical, textual or pictorial information from the first system.

The second system may, for example, receive information of the view over the wireless communication link (or secure channel thereof) established at step **320**. Alternatively, for example, the second system and first system may establish additional communication links or channels over which to communicate information of the view to the second system.

In general, step **340** may comprise receiving information of the view from the first system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view, view type or way of communicating information of a view.

The method **300**, at step **350**, may comprise displaying the view on a display device of the second system. Characteristics of the view may change at various points in the viewing process. As mentioned previously, the view may comprise any of a large variety of view characteristics. The second system may, for example, provide a user of the second system the capability to adjust certain characteristics of the displayed view (e.g., view size, or changing a view between window form and icon form).

For example, in an exemplary scenario, the display device of the second system may present a view to a user in a window format. The user may then, for example, vary characteristics of the view and/or window. For example and without limitation, the user may alter the dimensions of the window or reduce the view to an icon when not immediately using the view. Alternatively, for example, a view may occupy an entire display screen or multiple screens of the display device.

In general, step **350** may comprise the second system displaying the view on a display device. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view, view display, or way of displaying a view.

The method **300**, at step **360**, may comprise performing continued processing. For example and without limitation, step **360** may comprise receiving an indication from the first system indicating that the second system may control the original view of the first system. In an exemplary scenario, the first system may provide the second system the capability to move the original view of the first system (e.g., scrolling, slide turning, sizing, etc.). In another exemplary scenario in which the shared view comprises a view of a document, the first system may provide the second system the capability to edit the original document. The following discussion of the method **400** shown in FIG. **4** will focus on an exemplary document-editing scenario. However, it should be noted that the scope of various aspects of the present invention should not be limited by characteristics discussed with regard to the exemplary method **400**.

FIG. **4** is a flow diagram illustrating a method **400** for a second system in a wireless communication network to share a first system's document view and document editing capability, in accordance with various aspects of the present invention.

The method **400** may begin at step **410**. Various events and conditions may cause the method **400** to begin. For example, the first system may be performing processing in accordance with step **360** of the method **300** illustrated in FIG. **3** and discussed previously. Alternatively, for example, a user of the first system may direct the first system to provide document-editing capability to the second system. Also for example, the second system may have the ability to acquire the document editing capability without a directive from the first system. Further for example, a third moderating system may provide the second system with the capability to edit a document in a shared view. Generally, the method **400** may be initiated for a variety of causes and conditions. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular initiating events or conditions.

The method **400**, at step **420**, may comprise receiving an indication from the first system that the second system may edit a document of the shared view. For example, the indication may be communicated to the second system by a first

system operating according to step **220** of the method **200** illustrated in FIG. **2** and discussed previously. The first system may, for example, communicate an indication to the second system indicating that the second system (e.g., a user thereof) may edit a document in the shared view. As an example, the second system may receive a token from the first system (or other system) indicating that the second system has editing privileges for the document.

Step **420** may also comprise initializing various operational and communicational characteristics of the second system to be able to receive and process document editing information (e.g., from a user of the second system) and provide such document editing information to the first system. Such characteristics may comprise, for example, initializing a communication link over which such document editing information may be communicated (e.g., a secure communication link for editing a sensitive document).

In general, step **420** may comprise the second system receiving an indication from the first system (or other system) indicating that the second system has the capability to edit a document in a shared view from the first system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular way of receiving document-editing capability from the first system.

The method **400**, at step **430**, may comprise receiving document editing information (e.g., commands) from a user of the second system. For example, a user of the second system may utilize a user interface device to communicate document-editing information to the second system. Such a user interface device may, for example, comprise a keyboard, mouse, voice recognition device, touch screen, touch pad, etc. Such document editing information may, for example, comprise textual information, pictorial information, graphical information, cursor information, etc. In general step **430** may comprise receiving document editing information from a user of the second system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular user interface device or a particular type of document editing information.

The method **400**, at step **440**, may comprise communicating document editing information to the first system. Step **440** may, for example, comprise communicating document editing information to a first system that is performing processing in accordance with step **230** of the method **200** illustrated in FIG. **2** and discussed previously. The document editing information may, for example, comprise any of a large variety of document editing information types, some of which were discussed previously with regard to step **430**.

Step **440** may comprise communicating such document editing information to the first system in a variety of ways. For example, step **440** may comprise utilizing a wireless communication link between the second and first systems. Such a wireless communication link may, for example, comprise a wireless communication link as established at step **320** in the method **300** illustrated in FIG. **3** and discussed previously. For example, such a wireless communication link may comprise a secure wireless communication link.

In general, step **440** may comprise the second system communicating document-editing information with the first system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular document editing information or ways of communicating such information.

The method **400**, at step **450**, may comprise receiving from the first system information of a view comprising a view of the edited document. Such information may, for example, have been communicated to the second system by a first system performing processing in accordance with step **260** of the method **200** illustrated in FIG. **2** and discussed previously. For example, the first system may have edited the document or modified a view thereof in accordance with the editing information communicated to the first system by the second system at step **440**. Continuing the example, the first system may then have communicated information of the edited document or view to the second system.

In an exemplary scenario, a user of the second system may enter a keyboard command to delete a text character. The second system may receive editing information for the character deletion at step **430** and communicate such information to the first system at step **440**. The first system may edit the document or view thereof according to the information of the text character deletion. The first system may then communicate information of the edited document or modified view to the second system, which may receive such modified view or edited document information at step **450**.

In general, step **450** may comprise receiving information of the edited document (or modified view thereof) from the first system. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular editing (or view modification) information, editing information communication or editing information processing.

The method **400**, at step **460**, may comprise displaying the view comprising a view of the edited document on a display device. For example, this may enable a user of the second system to enter editing commands and view the effects of the editing commands in an expedient manner (e.g., in near real-time). Step **460** may, for example, share various view displaying characteristics with steps **350**, **250** and **130** as illustrated in FIGS. **1-3** and discussed previously. The displayed view may, for example, comprise any of a variety of view characteristics as discussed previously. In general, step **460** may comprise displaying a view of the edited document or modified view thereof. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view or way of displaying such a view.

The method **400**, at step **470**, may comprise performing continued processing. For example and without limitation, step **470** may comprise performing additional editing of the document using the second system. Step **470** may also, for example comprise releasing the capability of the second system to edit the document (e.g., passing editing capability back to the first system or to a third system). In generally, step **470** may comprise performing continued processing generally related to the shared view. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular continued processing activities that the second system may perform.

FIG. **5** is a diagram showing an exemplary system **500** that provides view sharing, in accordance with various aspects of the present invention. The exemplary system **500** may comprise a first system **510** and a second system **550**.

The first system **510** may comprise a processing module **512**, which may comprise a view-sharing sub-module **514**. The first system **510** may comprise a communication module **515**, secure communication module **517** and secure access module **520**. The first system **510** may also comprise a user interface module **525**, memory module **530** and an application **540**. Various modules or components of the first system **510** may, for example, perform various aspects of the methods **100**, **200** illustrated in FIGS. **1-2** and discussed previously.

The second system **550** may comprise a processing module **552**, which may comprise a view-sharing sub-module **554**.

The second system **550** may also comprise a communication module **555**, secure communication module **557**, and secure access module **560**. The second system **550** may further comprise a user interface module **565**. Various modules or components of the second system **550** may, for example, perform various aspects of the methods **300**, **400** illustrated in FIGS. **3-4** and discussed previously.

The following discussion will often refer to views and view sharing. Additionally, the following discussion will also refer to various exemplary scenarios that may comprise sharing a view of a document (e.g., a word processing document, presentation document, or graphics document). Information of such an exemplary document view may, for example, be generated by the processing module **512** executing an application **540** (e.g., a document processing application) of the first system **510**. It should be noted that the scope of various aspects of the present invention should not be limited by characteristics of a particular view or by how such a view may be presented to a user by various systems.

The first system **510** may comprise a processing module **512** that is communicatively coupled to a display device **580**. For example and without limitation, the processing module **512** may communicate view information to a display driver that, in turn, drives components of the display device **580** to present the view in a human-perceivable form. Characteristics of the view may change at various points in the viewing process. The view may be dynamic or static. That is, the view may comprise an image that is not changing and/or an image that is changing. In general, the view may comprise any of a large variety of view characteristics.

For example, in an exemplary scenario, the display device **580** may present a view to a user in a window format. The user may then, for example, vary characteristics of the view and/or window. For example and without limitation, the user may alter the dimensions of the window or reduce the view to an icon when not immediately using the view. Alternatively, for example, a view may occupy an entire display screen or multiple screens of the display device **580**.

The processing module **512** may be communicatively coupled to the communication module **515**. The communication module **515** may establish a two-way wireless communication link between the first system **510** and the second system **550**. For example and without limitation, the communication module **515** may perform such communication link establishment in accordance with step **140** of the method **100** illustrated in FIG. **1** and discussed previously.

The exemplary system **500** illustrates a two-system view-sharing scenario for the sake of clarity. However, various aspects of the present invention readily extend to dynamic wireless communication networks comprising more than two systems. For example and without limitation, the first system **510** may share a view with two systems, three systems, or other number of systems in the dynamic wireless communication network. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of view sharing between only two systems.

The communication module **515** may establish the two-way wireless communication link between the first system **510** and the second system **550** using any of a variety of communication media and protocols. For example, the two-way wireless communication link may comprise an RF communication link and/or an optical communication link. Also for example, the two-way wireless communication link may be based on any of a large number of standard or propriety communication protocols. Various standard communication protocols may, for example, comprise IEEE 802.11, 802.15, Bluetooth, or ultra-wideband (UWB) communication protocols. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular wireless communication medium and/or communication protocol.

The first system **510** may, for example, through the communication module **515**, receive a request for the first system **510** to share a view with the second system **550**. For example and without limitation, the first system **510** may receive such a request in accordance with step **150** of the method **100** illustrated in FIG. **1** and discussed previously. Such a request may, for example, originate from the first system **510** or the second system **550** (e.g., from a user of the first system **510** or a user of the second system **550**). Such a request may, for example, comprise a request for a particular view or any view.

In an exemplary scenario, a user of the second system **550** may initiate a request at a user interface device **579** communicatively coupled to a user interface module **565** of the second system **550**. The second system **550** may then, for example, utilize a communication module **555** to communicate the request to the first system **510**. In another exemplary scenario, the first system **510** may communicate with the second system **550** to ask the second system **550** (or user thereof) whether the second system **550** desires to share a particular view of the first system **510**.

In an additional exemplary scenario, a user of the first system **510** may initiate a view-sharing request at a user interface device **578** communicatively coupled to a user interface module **525** of the first system **510**. In general, the first system **510** may receive a request to share a view with the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular request (or source thereof) for sharing a view or mechanism for handling such a request.

Still further, for example, the first system **510** may communicate view information to the second system **550** without an explicit request from the second system **550** for the first system **510** to share the view. In an exemplary scenario, a user of the first system **510** may select the second system from a list of systems in the wireless communication network. The first system **510** may respond to the user request by communicating information of the view to the second system **550** without receiving a request from the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by whether or not the second system **550** or user thereof requests the first system **510** to share a view with the second system **550**.

The processing module **512** of the first system **510** may be communicatively coupled to the secure access module **520**. The processing module **512** may utilize the secure access module **520** to determine whether to share a view with the second system **550** (e.g., the second system **550** or user thereof). For example and without limitation, the secure access module **520** may utilize the user interface module **525** and/or display **580** to communicate with a user of the first system **510** to determine whether the second system **550** should have access to the view. Alternatively, for example, the secure access module **520** may analyze a list of authorized systems and/or users **531** to determine whether the second system **550** should have access to the view. Such a list **531** may, for example, reside in the memory module **530** or other memory accessible to the first system **510**. Also for example, in a scenario involving sharing a view that comprises sensitive information, the secure access module **520** may analyze the secure communication capability of the second system **550** to determine whether the second system **550** has the necessary secure communication capability to protect the sensitive information in the view.

Further, for example, the secure access module **520** may communicate a variety of authorization and authentication information with the second system **550**. In general, the secure access module **520** may perform any of a variety of authorization and/or authentication operations. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular way of determining whether to share the view with the second system or by characteristics of particular mechanisms for performing such a determination.

If, for example, the secure access module **520** determines that the second system **550** is not authorized to share the view, then the first system **510** (e.g., the view-sharing sub-module **514**) may terminate processing related to sharing the view between the first system **510** and the second system **550**. Alternatively, for example, if the secure access module **520** determines that the second system **550** is authorized to share the view, then the first system **510** (e.g., the view-sharing sub-module **514**) may continue processing related to sharing the view between the first system **510** and the second system **550**. For example, the first system **510** may perform various aspects of step **170** of the method **100** illustrated in FIG. **1** and discussed previously.

The view-sharing sub-module **514** may, for example, perform various view-sharing processing for the first system **510**. For example, the view-sharing sub-module **514** may utilize the communication module **515** to communicate information of the view to the second system **550** in any of a variety of ways. For example and without limitation, the view-sharing sub-module **514** may communicate JPEG and/or MPEG encoded information to the second system **550**. Also for example, the view-sharing sub-module **514** may communicate graphical, pictorial and textual information to the second system **550**.

The view-sharing module **514** may, for example, communicate information of the view to the second system **550** over a wireless communication link established by the communication module **515**. Alternatively, for example, the view-sharing sub-module **514** may utilize the communication module **515** to establish additional communication links or channels over which to communicate information of the view to the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular view information types or characteristics of particular communication links or channels utilized to communicate the view information from the first system to the second system.

The first system **510** may comprise a secure communication module **517**. The first system **510** may, for example, utilize the secure communication module **517** to establish a secure wireless communication link (e.g., one-way or two-way) between the first system **510** and the second system **550**. For example, in a scenario where the shared view comprises sensitive information, the first system **510** (e.g., the view-sharing sub-module **514**) may utilize the secure communication module **517** to establish a secure communication link comprising encryption and decryption of at least the sensitive information in the shared view. The first system may, for example, utilize the secure communication module **517** to add secure communication capability to a new wireless communication link or a pre-existing wireless communication link (e.g., a wireless communication previously established by the communication module **515**).

The view-sharing module **514** may, for example, perform additional processing steps for utilizing the shared view. For example, the first system **510** and/or second system **550** may communicate information to modify and/or edit the shared view. For example, the first system **510** may provide the second system **550** (e.g., a user thereof) the capability to modify aspects of the original shared view at the first system **510**. The first system **510** may then, for example, receive and process view modification information received from the second system **550**.

In one exemplary scenario, the first system **510** may provide the second system **550** the ability to control movement or other characteristics of the original view at the first system **510**. The first system **510** may then, for example, receive view modification information from the second system **550**. In another exemplary scenario, the first system **510** may provide the second system **550** the ability to edit a document in the original view at the first system **510**. The first system may then, for example, receive document-editing information from the second system **550**.

In an exemplary scenario, the shared view may comprise a view of a document, and the first system **510** may provide the second system **550** the capability to view and edit the document of the view. The following discussion will focus on this exemplary scenario. Note, however, that characteristics of the following exemplary scenario should by no means limit the scope of various aspects of the present invention.

In the exemplary scenario, a user of the first system **510** or the second system **550** may request that the first system **510** share a view with the second system **550**. Additionally, a user of the first system **510** or the second system **550** may request that the first system **510** provide the second system **550** the capability to edit the document.

The first system **550** (e.g., the view-sharing sub-module **514**) may provide to the second system **550** the capability to edit the document in the shared view. The first system **510** may, for example and without limitation, provide such capability to the second system **550** in accordance with step **220** of the method **200** illustrated in FIG. **2** and discussed previously. The first system **510** may, for example, communicate to the second system **550** that the second system **550** (e.g., a user thereof) may edit a document in the shared view. As an example, the first system **510** may pass a token to the second system **550** indicating that the second system **550** has editing privileges for the document.

To provide such capability to the second system **550**, the first system **510** may initialize various operational and communicational characteristics of the first system **510** to be able to receive and process document-editing information from the second system. For example, the first system **510** may utilize the communication module **515** to initialize a communication link over which such document editing information may be communicated. Also for example, the first system **510** may utilize the secure communication module **517** to initialize a secure communication link over which sensitive document editing information may be communicated. In general, the first system **510** may provide the capability to the second system **550** to edit a document in a shared view. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular way or mechanism for providing the document editing capability to the second system **550**.

Continuing the exemplary scenario, the first system **510** may utilize the communication module **515** to receive document-editing information from the second system **550**. The first system **510** may, for example, receive such document editing information in accordance with step **230** of the method **200** illustrated in FIG. **2** and discussed previously. For example, a user of the second system **550** may use the user interface device **579** coupled to the second system **550** to type, modify graphics, cut and paste elements, and generally

perform any editing capability as though the document and associated processing application were residing on the second system **550**. This may be the case, for example, even though the second system **550** may not include the data associated with the original document or the particular document processing application that is generating the original view of the document at the first system **510**. The first system **510** may generally receive document-editing information from the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular types of editing information or particular ways or mechanisms for communicating such information.

The first system **510** may, for example, edit the original document of the view according to document editing information received from the second system **550**. The first system **510** may, for example and without limitation, perform such editing in accordance with step **240** of the method **200** illustrated in FIG. **2** and discussed previously. For example, the first system **510** may receive any of a large variety of editing commands from the second system **550** (e.g., cut, paste, delete, insert text, cursor movement, drawing selection, etc.). The first system **510** (e.g., the processing module **512**) may process the editing commands from the second system **550** as though the commands originated at the first system **510**. For example, the processing module **510** may execute the application **540** (e.g., a document processing application) generating the document in a manner that is independent of the source of the editing commands.

In an exemplary illustration, the first system **510** may create an editing command path from the second system **550** through the communication module **515**. The first system **510** may then replace the typical editing command path from the user interface module **525** of the first system **510** with the command path from the second system **550**. In general, the first system **510** (e.g., the processing module **512** executing the application **540**) may edit the original document of the view according to document editing information received from the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular ways of processing such editing commands.

Continuing the exemplary scenario, the first system **510** may display the view comprising the edited document. The first system **510** may, for example and without limitation, perform such view displaying in accordance with step **250** of the method **200** illustrated in FIG. **2** and discussed previously. For example, after the processing module **512** utilizes the application **540** (e.g., the document processing application) to edit the document of the view according to instructions from the second system **550**, the processing module **512** may provide information of a view comprising the edited document to the display device **580**. In such an exemplary scenario, a user of the first system **510** can view changes made to a document by a user of the second system **550**.

The first system **510** may communicate information of the view comprising the edited document to the second system **550**. The first system **510** may, for example and without limitation, perform such communication in accordance with step **260** of the method **200** illustrated in FIG. **2** and discussed previously. For example, the view-sharing sub-module **514** may communicate information of the view to the second system **550** via the communication module **515**. In such an exemplary scenario, a user of the second system **550** that is generating the document editing commands may view the document modifications resulting from the user's editing commands.

The first system **510** may, for example, perform a variety of further processing related to the shared view in accordance with commands provided by a user of the second system **550** and/or a user of the first system **510**.

Returning to the general discussion of the system **500** illustrated in FIG. **5**, the second system **550** may establish a two-way wireless communication link with the first system **510**. The second system **550** may, for example and without limitation, establish such a communication link in accordance with step **320** of the method **300** illustrated in FIG. **3** and discussed previously. For example, the second system **550** may comprise a communication module **555** that establishes a two-way wireless communication link between the second system **550** and the first system **510**.

The second system **550** may comprise a secure communication module **557** that may integrate secure communication capability into the two-way wireless communication link. For example, in an exemplary scenario where information of the shared view (or other communicated information) is sensitive, the second system **550** may communicate with the first system **510** to establish a secure communication link between the second system **550** and the first system **510**. Such a secure communication link may, for example, comprise performing any of a large variety of secure communication techniques (e.g., encryption and frequency hopping). Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular secure communication techniques or mechanisms.

The second system **500** may comprise a secure access module **560** that may, for example, obtain and communicate secure access information with the first system **510**. For example, in an exemplary scenario where the shared view comprises sensitive information, or where other communicated information between the second system **550** and the first system **510** may be sensitive, the first system **510** may require that the second system **550** (or user thereof) be authorized to access the view. For example, the first system **510** may have access to a list of authorized systems and/or users that may access the view.

The first system **510** may, for example, require the second system **550** to communicate any of a variety of secure access information (e.g., authorization or authentication information) to the first system **510**. Such information may, for example, comprise system identification information and user identification information (e.g., user ID and password, retinal scan, thumb print, facial pattern information, voice patter information). The second system **550** (e.g., the secure access module **560**) may then communicate any necessary secure access information to the first system **510** (e.g., the secure access module **520**) for the first system **510** to utilize in determining whether the second system **550** should be allowed access to the view. The secure access module **560** may generally communicate secure access information with the first system **510**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular secure access information, communication or processing techniques.

The second system **550** may communicate a request to the first system **510** for the first system to share a view with the second system **550** (e.g., a view that the first system is currently displaying). For example and without limitation, the second system **550** may communicate such a request in accordance with step **330** of the method **300** illustrated in FIG. **3** and discussed previously.

Such a request, for example, may comprise an open request for a view or may comprise a request for a specific view. Such a request may, for example, originate from a user of the user

interface device **579** that is communicatively coupled to the user interface module **565** of the second system **550**. Such a request may, for example, be in response to an offer to provide a view that was communicated to the second system **550** by the first system **510**.

The second system **550** may utilize the communication module **555** to communicate such a request to the first system **510** over a wireless communication link. In general, the second system **550** may communicate a request to the first system **510** to share a view with the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular request, request type, request source, or way of communicating such a request.

The second system **550** may receive information of the shared view from the first system **510**. For example and without limitation, the second system **550** may receive information of the view in accordance with step **340** of the method **300** illustrated in FIG. **3** and discussed previously. The second system **550** may, for example, utilize the communication module **555** to receive information of the view from the first system **510**. Such information may, for example, have been communicated to the second system **550** by the first system **510** in accordance with method step **190** of the method **100** illustrated in FIG. **1** and discussed previously.

The second system **550** may receive information of the view in a variety of ways. For example and without limitation, the second system **550**, through the communication module **555**, may receive JPEG and/or MPEG encoded information from the first system **510**. Also for example, the second system **550** may receive graphical, textual or pictorial information from the first system **510**.

In general, the second system **550** may receive information of the view from the first system **510**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view, view type or way of communicating information of a view.

The second system **550** may display the view on the display device **590**, which may be communicatively coupled to the second system **550** (e.g., to the processing module **552** of the second system **550**). For example and without limitation, the second system **550** may display the view in accordance with step **350** of the method **300** illustrated in FIG. **3** and discussed previously.

The second system **550** may, for example, utilize the view-sharing sub-module **554** of the processing module **552** to process the view information received from the first system **510**. The view-sharing sub-module **554** may then communicate information of the view to the display device **590** (e.g., to display driving circuitry corresponding to the display device **590**).

Characteristics of the view may change at various points in the viewing process. As mentioned previously, the view may comprise any of a large variety of view characteristics. The second system **550** may, for example, provide a user of the second system **550** the capability to adjust certain characteristics of the displayed view (e.g., view size, or changing a view between window form and icon form).

For example, in an exemplary scenario, the display device **590** coupled to the second system **550** may present a view to a user in a window format. The user may then, for example, vary characteristics of the view and/or window. For example and without limitation, the user may alter the dimensions of the window or reduce the view to an icon when not immediately using the view. Alternatively, for example, a view may occupy an entire display screen or multiple screens of the display device **590**.

In general, the second system **550** may communicate information of the view to a display device. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view, view display, or way or displaying a view.

The second system **550** may, for example, perform additional processing steps related to the shared view. For example, the second system **550** and/or first system **510** may communicate information to modify and/or edit the shared view. For example, the second system **550** may receive from the first system **510** the capability to modify aspects of the original shared view at the first system **510**. The second system **550** may then, for example, provide view modification information to the first system **510** for further processing.

In an exemplary scenario, the shared view may comprise a view of a document, and the second system **550** may receive from the first system **510** the capability to view and edit the document of the view. The following discussion will focus on this exemplary scenario. Note, however, that characteristics of the following exemplary scenario should by no means limit the scope of various aspects of the present invention.

In the exemplary scenario, a user of the second system **550** (e.g., using the user interface device **579**) or a user of the first system **510** (e.g., using the user interface device **578**) may request that the first system **510** share a view comprising a view of a document with the second system **550**. Additionally, a user of the second system **550** or the first system **510** may request that the first system **510** provide the second system **550** the capability to edit the document.

The second system **550** may receive an indication from the first system **510** that the second system **550** may edit a document of the shared view. The second system **550** may, for example and without limitation, receive such an indication in accordance with step **420** of the method **400** illustrated in FIG. **4** and discussed previously. For example, the processing module **552** (or view-sharing module **554**) may receive such an indication in a signal received by the communication module **555** from the first system **510** over a wireless communication link.

For example, the indication may be communicated to the second system **550** by a first system **510** operating according to step **220** of the method **200** illustrated in FIG. **2** and discussed previously. The first system **510** may, for example, utilize the communication module **515** of the first system **510** to communicate to the second system **550** that the second system **550** (e.g., a user thereof) may edit a document in the shared view. As an example, the second system **550** may receive a token from the first system **510** (or other system) indicating that the second system **550** has editing privileges for the document.

The second system **550** may also, for example, initialize various operational and communicational characteristics of the second system **550** to be able to receive, process and communicate document editing information (e.g., from a user of the user interface device **579** communicatively coupled to the user interface module **565** of the second system **550**) and communicate such document editing information to the first system **510**. Such initialization may comprise, for example, utilizing the communication module **555** and/or the secure communication module **557** to establish a communication link over which such document editing information may be communicated to the first system **510**.

In general, the second system **550** may receive an indication from the first system **510** (or other system) that the second system **550** has the capability to edit a document in a view shared by the first system **510**. Accordingly, the scope of various aspects of the present invention should not be limited

by characteristics of a particular way of receiving document-editing capability from the first system.

The second system **550** may, for example, receive document-editing information (e.g., commands) from a user of the second system **550**. For example and without limitation, the second system **550** may receive such document editing information in accordance with step **430** of the method **400** illustrated in FIG. **4** and discussed previously.

For example, a user of the second system **550** may utilize the user interface device **579** to communicate document-editing information to the second system **550** via the user interface module **565**. Such a user interface device **579** may, for example, comprise a keyboard, mouse, voice recognition device, touch screen, touch pad, etc. Such document editing information may, for example, comprise textual information, pictorial information, graphical information, cursor information, etc.

In general, the second system **550** may receive document-editing information from a user of the second system **550**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular user interface device or of a particular type of document editing information.

The second system **550** may, for example, communicate document-editing information to the first system **510**. The second system **550** may, for example and without limitation, communicate such information to the first system **510** in accordance with step **440** of the method **400** illustrated in FIG. **4** and discussed previously. For example, the view-sharing sub-module **554** may utilize the communication module **555** to communicate document-editing information to the first system **510**. The document editing information may, for example, comprise any of a large variety of document editing information types, some of which were discussed previously.

The second system **550** may communicate such document editing information to the first system **510** in a variety of ways. For example, the second system **550** may utilize a wireless communication link established between the communication module **555** of the second system **550** and a communication module **515** of the first system **510**. Such a wireless communication link may, for example, comprise a wireless communication link as established at step **320** in the method **300** illustrated in FIG. **3** and discussed previously. For example, such a wireless communication link may comprise a secure wireless communication link.

In general, the second system **550** may communicate document-editing information to the first system **510**. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular document editing information or a way or mechanism for communicating such information.

The second system **550** may receive from the first system information of a view comprising a view of the document edited in accordance with the document editing information provided to the first system **510** by the second system **550**. For example and without limitation, the second system **550** may receive such information in accordance with step **450** of the method **400** illustrated in FIG. **4** and discussed previously.

For example, the first system **510** may have edited the document or modified a view thereof in accordance with the editing information communicated to the first system **510** by the second system **550**. Continuing the example, the first system **510** may then have communicated information of the edited document or view to the second system **550**.

In an exemplary scenario, a user of the second system **550** may enter a keyboard command on the user interface device **579** to delete a text character in the document. The second system **550** may receive editing information for the deleted character via the user interface module **565** and communicate such information to the first system **510** via the communication module **555**. The first system **510** may edit the document or view thereof according to the information of the text character deletion received from the second system **550**. The first system **510** may then communicate information of the edited document or modified view to the second system **550**, which may receive such modified view or edited document information.

In general, the second system **550** may receive information from the first system **510** of a view of the edited document (or modified view). Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular view information or ways of communicating or processing such view information.

The second system **550** may display the view comprising the edited document in accordance with information received from the first system **510**. For example, the processing module **552** (e.g., the view-sharing sub-module **554**) may provide the view information to the display device **590**, which in turn, may display the view. For example, this may enable a user of the second system **550** to enter editing commands and view the effects of the editing commands in an expedient manner (e.g., in near real-time).

A displayed view may, for example, comprise any of a variety of view characteristics as discussed previously. In general, the second system **550** (or a display device coupled thereto) may display a view of the edited document or modified view thereof. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of a particular view or way of displaying such a view.

The second system **550** may, for example, perform a variety of additional processing related to the shared view. For example and without limitation, the second system **550** may provide for additional editing of the document using various resources of the second system **550**. The second system **550** may also, for example, release the capability of the second system **550** to edit the document (e.g., passing editing capability back to the first system **510** or to a third system). In generally, the second system **550** may perform continued processing related to the shared view. Accordingly, the scope of various aspects of the present invention should not be limited by characteristics of particular continued processing activities that the second system **550** may perform.

The various systems and modules illustrated in the exemplary system **500** of FIG. **5** may, for example, be implemented in hardware or software. Various systems and modules may for example be implemented in application software or operating system functionality. For example, various modules may be integrated into a single integrated circuit. Accordingly, the scope of various aspects of the present invention should by no means be limited to particular hardware or software implementations of the various modules and components discussed previously.

FIG. **6** is a diagram illustrating an exemplary view sharing and document-editing scenario **600** in accordance with various aspects of the present invention. The scenario **600** is presented here to illustrate one of a large number of scenarios that may utilize various aspects of the present invention, and accordingly, the scope of various aspects of the present invention should by no means be limited by characteristics of the exemplary scenario **600**.

The exemplary view sharing and document-editing scenario **600** may include a first system **610** and a second system **650**. The first system **610** may, for example, comprise a desktop computing system, and the second system **650** may, for

example, comprise a laptop computing system. For example, the first system **610** may communicate information of the view comprising document A to the second system **550** (e.g., using MPEG image encoding technology) over a wireless communication link **651**. The second system **650** may then display the shared view of document A on a display device of the second system **650**. Respective users of the first system **610** and/or the second system **650** may, for example, control the size and location of respective windows or screens on which the respective views are displayed.

As an example, view-sharing hardware (e.g., a view-sharing module) of the second system **650** may track the position and dimensions of the window on the second system **650** display. The second system **650** (e.g., a view-sharing module) may also track the movement of the second system **650** cursor and second system **650** buttons and keystrokes. For example, when the user of the second system **650** selects a position on the shared view with the cursor and begins to type, the second system **650** may communicate window information, cursor information, mouse information, keystroke information, etc. to the first system **610**. The first system **610** may then, for example, convert the information received from the second system **650** to a format compatible with the first system **610**. The first system **610** may then utilize the user input information from the second system **650** to modify (or edit) the original document or view on the first system **610**.

Upon modifying the original document on the first system **610**, the first system **610** may then communicate an updated view of the document (or view) to the second system **650**. The second system **650** user may thereby edit a shared document without having an application on the second system **650** that is compatible with the application responsible for generating the original view on the first system **610**. For example, the second system **650** user may edit a shared spreadsheet without having a compatible spreadsheet application.

Of course, various combinations of view-sharing functionality and application functionality are possible without departing from the spirit and scope of various aspects of the present invention. For example and without limitation, view-sharing functionality of the first system **610** and the second system **650** may comprise communicating view information and editing information in a way that is efficiently understood by compatible document processing applications executing on the first system **610** and the second system **650**.

In summary, various aspects of the present invention provide a system and method for sharing a view between systems in a dynamic wireless network environment. While the invention has been described with reference to certain aspects and embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from its scope. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed, but that the invention will include all embodiments falling within the scope of the appended claims.

What is claimed is:

1. A method comprising:

in a first system:

establishing a direct wireless communication link with a second system in which the direct wireless communication link does not connect through any intermediate system between the first system and the second system;

sending, through the direct wireless communication link, a view sharing request to the second system, where the view sharing request specifies a view displayed by the second system that is not presently displayed by the first system;

receiving, through the direct wireless communication link, view information corresponding to the view displayed by the second system and specified by the view sharing request;

displaying, with the first system, the view according to the view information received from the second system;

receiving, through the direct wireless communication link, view adjustment information specifying a change in view characteristics of the displayed view; and

adjusting characteristics of the displayed view in the first system according to the view adjustment information without adjusting how the view is displayed in the second system.

2. The method of claim **1**, comprising:

establishing multiple communication links with the second system, including the direct wireless communication link.

3. The method of claim **2**, comprising:

receiving, through the multiple communication links, the view information corresponding to the view displayed by the second system.

4. The method of claim **3**, where establishing multiple communication links comprises:

establishing a secure communication link with the second system; and

where receiving the view information comprises:

receiving selected sensitive information of the view information through the secure communication link.

5. The method of claim **4**, where receiving the view information further comprises:

receiving non-sensitive information of the view information through the secure communication link.

6. The method of claim **1**, where establishing a direct wireless communication link comprises:

establishing a direct Bluetooth communication link with the second system.

7. The method of claim **1**, where establishing a direct wireless communication link comprises:

establishing a direct 802.11 wireless communication link with the second system.

8. The method of claim **1**, wherein adjusting characteristics of the displayed view in the first system comprises adjusting the view in the first system without adjusting how the view is displayed in the second system.

9. The method of claim **1** wherein displaying the view according to the view information comprises displaying a window including the view and wherein receiving the view adjustment information comprises receiving window size adjustment information and wherein adjusting characteristics of the displayed view comprises changing window size of the window including the view.

10. A device comprising:

a user interface;

a communication interface; and

view sharing circuitry in communication with the user interface and the communication interface, the view sharing circuitry operable to:

establish a wireless communication link with a second device through the communication interface;

send, through the wireless communication link, a video sharing request to the second device, where the video

sharing request specifies a video displayed by the second device that is not presently displayed through the user interface;

receive, through the wireless communication link, video information corresponding to the video displayed by a second system and specified by the video sharing request;

display, through the user interface, the video according to the video information received from the second device while the second device displays the video at the same time;

receive, through the wireless communication link, display adjustment information specifying a change in view characteristics of the displayed video; and

adjust the displayed video in the user interface according to the display adjustment information without adjusting how the view is displayed in the second system.

11. The device of claim **10**, where the view sharing circuitry is operable to establish, through the communication interface, multiple communication links with the second device, including the wireless communication link.

12. The device of claim **11**, where the view sharing circuitry is operable to receive, through the multiple communication links, the video information corresponding to the video displayed by the second device.

13. The device of claim **12**, where:

the multiple communication links include a secure communication link with the second device; and

where the video information comprises selected sensitive information of the video information sent through the secure link.

14. The device of claim **13**, where the video information comprises non-sensitive information of the video information sent through the secure communication link.

15. The device of claim **10**, where the wireless communication link comprises a Bluetooth communication link.

16. The device of claim **10**, where the wireless communication link comprises an 802.11 wireless communication link.

17. The device of claim **10**, wherein the view sharing circuitry is operable to adjust the displayed video in a first system without adjusting how the displayed video is displayed in the second system.

18. The device of claim **10**, wherein displaying the video according to the view information comprises displaying, through the user interface, a window including the video and wherein receiving the display adjustment information comprises receiving window size adjustment information and wherein adjusting the displayed video comprises changing window size of the window including the video on the user interface.

19. A product comprising:

a non-transitory machine readable medium; and

logic stored on the non-transitory machine readable medium, that when executed by a processor of a first system, causes the first system to:

establish a wireless communication link with a second system different from the first system;

send a view sharing request to the second system, where the view sharing request specifies a view displayed by the second system that is not presently displayed by a first system;

receive, through the wireless communication link, view information corresponding to the view displayed by the second system and specified by the view sharing request;

display the view according to the view information received from the second system;

receive a display adjustment specifying a change in how to display the view on the first system; and

adjust the display of the view in the first system according to the display adjustment without adjusting how the view is displayed in the second system.

20. The product of claim **19**, where the display adjustment specifies changing a window size of a window displaying the view.

21. The product of claim **19**, where the display adjustment specifies minimizing the display of the view to an icon.

22. The product of claim **19**, where the processor executable instructions cause the first system to establish multiple communication links with the second system, including the wireless communication link.

23. The product of claim **22**, where the processor executable instructions cause the first system to receive, through the multiple communication links, the view information corresponding to the view displayed by the second system.

24. The product of claim **19**, where the processor executable instructions cause the first system to add a secure communication capability to the wireless communication link.

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